

WHAT IS CLAIMED IS:

1           1.    A nonaqueous electrolyte secondary battery comprising a  
2   positive electrode including a positive electrode active material,  
3   a negative electrode including a carbon material as a negative  
4   electrode active material and a nonaqueous electrolyte including a  
5   solvent and a solute, wherein sulfolane is contained as a solvent  
6   in the nonaqueous electrolyte and vinyl ethylene carbonate and  
7   vinylene carbonate or a derivative of vinylene carbonate are added  
8   to the nonaqueous electrolyte.

1           2.    The nonaqueous electrolyte secondary battery according to  
2   claim 1, wherein sulfolane is contained in an amount of at least 15  
3   % by volume, on the basis of the total volume of the solvent.

1           3.    The nonaqueous electrolyte secondary battery according to  
2   claim 1, wherein the amount of vinyl ethylene carbonate added to  
3   the nonaqueous electrolyte is in a range of 0.1 ~ 5 parts by weight  
4   per 100 parts by weight of the nonaqueous electrolyte.

1           4.    The nonaqueous electrolyte secondary battery according to  
2   claim 2, wherein the amount of vinyl ethylene carbonate added to  
3   the nonaqueous electrolyte is in a range of 0.1 ~ 5 parts by weight  
4   per 100 parts by weight of the nonaqueous electrolyte.

1           5.    The nonaqueous electrolyte secondary battery according to  
2   claim 1, wherein the amount of vinylene carbonate or a derivative  
3   thereof added to the nonaqueous electrolyte is in a range of 0.1 ~  
4   5 parts by weight per 100 parts by weight of the nonaqueous  
5   electrolyte.

1           6.    The nonaqueous electrolyte secondary battery according to  
2   claim 2, wherein the amount of vinylene carbonate or a derivative  
3   thereof added to the nonaqueous electrolyte is in a range of 0.1 ~  
4   5 parts by weight per 100 parts by weight of the nonaqueous  
5   electrolyte.

1           7.    The nonaqueous electrolyte secondary battery according to  
2   claim 3, wherein the amount of vinylene carbonate or a derivative  
3   thereof added to the nonaqueous electrolyte is in a range of 0.1 ~  
4   5 parts by weight per 100 parts by weight of the nonaqueous  
5   electrolyte.

1           8.    The nonaqueous electrolyte secondary battery according to  
2   claim 4, wherein the amount of vinylene carbonate or a derivative  
3   thereof added to the nonaqueous electrolyte is in a range of 0.1 ~  
4   5 parts by weight per 100 parts by weight of the nonaqueous  
5   electrolyte.

1           9.    The nonaqueous electrolyte secondary battery according to  
2   claim 1, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           10. The nonaqueous electrolyte secondary battery according to  
2   claim 2, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           11. The nonaqueous electrolyte secondary battery according to  
2   claim 3, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           12. The nonaqueous electrolyte secondary battery according to  
2   claim 4, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           13. The nonaqueous electrolyte secondary battery according to  
2   claim 5, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           14. The nonaqueous electrolyte secondary battery according to  
2   claim 6, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3   butyrolactone and sulfolane as the main solvents.

1           15. The nonaqueous electrolyte secondary battery according to  
2 claim 7, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3 butyrolactone and sulfolane as the main solvents.

1           16. The nonaqueous electrolyte secondary battery according to  
2 claim 8, wherein the nonaqueous electrolyte contains  $\gamma$ -  
3 butyrolactone and sulfolane as the main solvents.

1           17. The nonaqueous electrolyte secondary battery according to  
2 claim 1, wherein the carbon material has a ratio ( $I_D/I_G$ ) of a Raman  
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or  
4 greater.

1           18. The nonaqueous electrolyte secondary battery according to  
2 claim 2, wherein the carbon material has a ratio ( $I_D/I_G$ ) of a Raman  
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or  
4 greater.

1           19. The nonaqueous electrolyte secondary battery according to  
2 claim 3, wherein the carbon material has a ratio ( $I_D/I_G$ ) of a Raman  
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or  
4 greater.

1           20. The nonaqueous electrolyte secondary battery according to  
2 claim 5, wherein the carbon material has a ratio ( $I_D/I_G$ ) of a Raman  
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or  
4 greater.